Oecologia

In Cooperation with the
International Association for Ecology (Intecol)

Vol. 65 1984/85

Editorial Board

F. A. Bazzaz, Urbana
P. J. den Boer, Wijster (Dr.)
F. S. Chapin III, Fairbanks
J. Ehleringer, Salt Lake City
P. R. Ehrlich, Stanford
M. Evenari, Jerusalem
J. L. Harper, Bangor
R. B. Huey, Seattle
H. Kaiser, Aachen
C. J. Krebs, Vancouver
O. L. Lange, Würzburg
W. Larcher, Innsbruck
J. Myers, Vancouver
D. Neumann, Köln
J. Phillipson, Oxford
H. Remmert, Marburg/Lahn
F. Schaller, Wien
Th. W. Schoener, Davis
E.-D. Schulze, Bayreuth
A. Watkinson, Norwich
T. C. R. White, Wagga Wagga
W. Wieser, Innsbruck
H. Ziegler, München
H. Zwölfer, Bayreuth

Editors in Chief: H. Remmert (Zoology) and E.-D. Schulze (Botany)

Springer International

Oecologia

Derived from *"Zeitschrift für Morphologie und Ökologie der Tiere"*, *Oecologia* was founded in 1968, Volumes (1968–1982), and edited by H. Remmert. As of Volume 53 (1982) the journal has been edited by both H. Remmert and E.-D. Schulze.

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the (publisher, society); and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA: Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. This fee is US $0.20 per page, or a minimum of US $1.00 if an article contains fewer than five pages. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0029-8549, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

Other regulations: Authors publishing in this journal can, under certain conditions, benefit from library and photocopy fees collected by VG WORT. Authors resident in the Federal Republic of Germany or in West Berlin can apply to Verwertungsgesellschaft WORT, Abteilung Wissenschaft, Goethestraße 49, D-8000 München 2, for detailed information.

Printers: Universitätsdruckerei H. Stürtz AG, Würzburg
© Springer-Verlag Berlin Heidelberg 1984/85

Contents

Adams, M.S., s. Boston, H.L. 573
Andrews, T.J., Muller, G.J.: Photosynthetic gas exchange of the mangrove, *Rhizophora stylosa* Griff., in its natural environment 449
Anlauf, A., s. Becker, P.H., et al. 431
Antonovics, J., s. Miller Alexander, H., et al. 89
Ashkenas, L.R., s. Menge, B.A., et al. 394
Ayre, D.J., s. Willis, B.L. 516
Barbault, R., Ortega, A., Maury, M.E.: Food partitioning and community organization in a mountain lizard guild of Northern Mexico 550
Bauer, G.: Population ecology of *Pardia tripunctana* Schiff. and *Notocelia roborana* Den. and Schiff. (Lepidoptera, Tortricidae) – an example of "Equilibrium species" . . 437
Bazzaz, F.A., s. Parrish, J.A.D. 247
Beck, E., s. Schulze, E.-D., et al. 207
Becker, P.H., Finck, P., Anlauf, A.: Rainfall preceding egg-laying – a factor of breeding success in Common Terns (Sterna hirundo) 431
Bierzychudek, P.: Determinants of gender in Jack-in-the-pulpit: the influence of plant size and reproductive history 14
Billings, W.D., Peterson, K.M., Luken, J.O., Mortensen, D.A.: Interaction of increasing atmospheric carbon dioxide and soil nitrogen on the carbon balance of tundra microcosms 26
Bloom, A.J.: Wild and cultivated barleys show similar affinities for mineral nitrogen 555
Borner, M., s. Sinclair, A.R.E., et al. 266
Boston, H.L., Adams, M.S.: Seasonal diurnal acid rhythms in two aquatic crassulacean acid metabolism plants . . 573
Breitburg, D.L.: Development of a subtidal epibenthic community: factors affecting species composition and the mechanisms of succession 173
Bryant, J.P., s. Reichardt, P.B., et al. 58
Burton, R.S., Swisher, S.G.: Population structure of the intertidal copepod *Tigriopus californicus* as revealed by field manipulation of allele frequencies 108
Calvert, J.J.: Food selection by western gorillas (*G.g. gorilla*) in relation to food chemistry 236
Clark, L.: Consequences of homeothermic capacity of nestlings on parental care in the european starling 387
Clausen, T.P., s. Reichardt, P.B., et al. 58
Comstock, J.P., Mahall, B.E.: Drought and changes in leaf orientation for two California chaparral shrubs: *Ceanothus megacarpus* and *Ceanothus crassifolius* 531
Crête, M., s. Messier, F. 44, 503
de Jong, T.J., Klinkhamer, P.G.L.: The negative effects of litter of parent plants of *Cirsium vulgare* on their offspring: autotoxicity or immobilization? 153
Decoux, J.-P., s. Gautier-Hion, A., et al. 324
Dublin, H., s. Sinclair, A.R.E., et al. 266
Dubost, G., s. Gautier-Hion, A., et al. 324
Duplantier, J.-M., s. Gautier-Hion, A., et al. 324
Ebert, T.A.: Sensitivity of fitness to macroparameter changes: an analysis of survivorship and individual growth in sea urchin life histories 461
Emmons, L., s. Gautier-Hion, A., et al. 324
Erard, C., s. Gautier-Hion, A., et al. 324
Famme, P., Knudsen, J.: Aerotaxis by the freshwater oligochaete *Tubifex* sp. 599
Feer, F., s. Gautier-Hion, A., et al. 324
Finck, P., s. Becker, P.H., et al. 431
Fritz, R.S., Morse, D.H.: Reproductive success and foraging of the crab spider *Misumena vatia* 194
Gates, D.M., s. Weber, J.A., et al. 338
Gautier-Hion, A., Duplantier, J.-M., Quris, R., Feer, F., Sourd, C., Decoux, J.-P., Dubost, G., Emmons, L., Erard, C., Hecketsweiler, P., Moungazi, A., Roussilhon, C., Thiollay, J.-M.: Fruit characters as a basis of fruit choice and seed dispersal in a tropical forest vertebrate community 324
Gilbert, N.: What they didn't tell you about limit cycles . . 112
Goldstein, G.H., s. Meinzer, F.C., et al. 278
Gollan, T., Turner, N.C., Schulze, E.-D.: The responses of stomata and leaf gas exchange to vapour pressure deficits and soil water content. III. In the sclerophyllous woody species *Nerium oleander* 356
Gollan, T., s. Turner, N.C., et al. 348
Gross, K.L., s. Mittelbach, G.G. 7
Grüm, L.: Carabid fecundity as affected by extrinsic and intrinsic factors 114
Gunnarsson, B.: Interspecific predation as a mortality factor among overwintering spiders 498
Hanhimäki, S., s. Haukioja, E. 223
Haukioja, E., Hanhimäki, S.: Rapid wound-induced resistance in white birch (*Betula pubescens*) foliage to the geometrid *Epirrita autumnata:* a comparison of trees and moths within and outside the outbreak range of the moth 223
Haukioja, E., Niemelä, P., Sirén, S.: Foliage phenols and nitrogen in relation to growth, insect damage, and ability to recover after defoliation, in the mountain birch *Betula pubescens* ssp *tortuosa* 214
Haukioja, E., Suomela, J., Neuvonen, S.: Long-term inducible resistance in birch foliage: triggering cues and efficacy on a defoliator 363
Hay, M.E., Taylor, P.R.: Competition between herbivorous fishes and urchins on Caribbean reefs 591
Hecketsweiler, P., s. Gautier-Hion, A., et al. 324
Heidorn, T., Joern, A.: Differential herbivory on C_3 versus C_4 grasses by the grasshopper *Ageneotettix deorum* (Orthoptera: acrididae) 19
Helle, E., s. Tahvanainen, J., et al. 319
Hino, T.: Relationships between bird community and habitat structure in shelterbelts of Hokkaido, Japan 442
Hurd, L.E.: On the importance of carrion to reproduction in an omnivorous estuarine neogastropod, *Ilyanassa obsoleta* (Say) 513
Ingrisch, S.: Effect of hibernation length on termination of diapause in European *Tettigoniidae* (Insecta: Orthoptera) 376
Jackson, D., Mason, C.F., Long, S.P.: Macro-invertebrate populations and production on a salt-marsh in east England dominated by Spartina anglica 406
Jacobs, J., s. Vareschi, E. 412
Jayasekera, R., s. Schleser, G.H. 536
Joern, A., s. Heidorn, T. 19
Julkunen-Tiitto, R., s. Tahvanainen, J., et al. 319
Jurik, T.W., s. Weber, J.A., et al. 338
Kamel, S., s. Pough, F.H. 138
Kasule, F.K.: A comparison of the reproductive strategies of three species of *Dysdercus* from Africa (Hemiptera, Pyrrhocoridae) 260
Kinsman, S., Platt, W.J.: The impact of a herbivore upon *Mirabilis hirsuta*, a fugitive prairie plant 2
Klinkhamer, P.G.L., s. de Jong, T.J. 153
Knapp, A.K.: Water relations and growth of three grasses during wet and drought years in a tallgrass prairie . . . 35
Knudsen, J., s. Famme, P. 599
Küppers, M.: Carbon relations and competition between woody species in a Central European hedgerow. III. Carbon and water balance on the leaf level 94
Lalonde, R.G., Shorthouse, J.D.: Growth and development of larvae and galls of *Urophora cardui* (Diptera, Tephritidae) on *Cirsium arvense* (Compositae) 161
Lampert, W., s. Weider, L.J. 487

Lavola, A., s. Tahvanainen, J., et al. 319
Laybourn-Parry, J., Tinson, S.: Respiratory studies on two benthic copepods *Acanthocyclops viridis* and *Eucyclops agilis* at environmental temperatures 566
Laybourn-Parry, J., s. Woombs, M. 289
Leather, S.R.: The effect of adult feeding on the fecundity, weight loss and survival of the pine beauty morth, *Panolis flammea* (D & S) 70
Lewis, S.M.: Herbivory on coral reefs: algal susceptibility to herbivorous fishes 370
Long, S.P., s. Jackson, D., et al. 406
Lubchenco, J., s. Menge, B.A., et al. 394
Luken, J.O., s. Billings, W.D., et al. 26
Mahall, B.E., s. Comstock, J.P. 531
Mason, C.F., s. Jackson, D., et al. 406
Maury, M.E., s. Barbault, R., et al. 550
McAuliffe, J.R.: Prey refugia and the distributions of two Sonoran Desert cacti 82
McNaughton, S.J.: Interactive regulation of grass yield and chemical properties by defoliation, a salivary chemical, and inorganic nutrition 478
Meinzer, F.C., Goldstein, G.H., Rundel, P.W.: Morphological changes along an altitude gradient and their consequences for an andean giant rosette plant 278
Menge, B.A., Lubchenco, J., Ashkenas, L.R.: Diversity, heterogeneity and consumer pressure in a tropical rocky intertidal community 394
Messier, F., Crête, M.: Body condition and population regulation by food resources in moose 44
Messier, F., Crête, M.: Moose-wolf dynamics and the natural regulation of moose populations 503
Miller Alexander, H., Antonovics, J., Rausher, M.D.: Relationship of phenotypic and genetic variation in *Plantago lanceolata* to disease caused by *Fusarium moniliforme* var. *subglutinans* 89
Mittelbach, G.G., Gross, K.L.: Experimental studies of seed predation in old-fields 7
Morris, D.W.: Sexual differences in habitat use by small mammals: evolutionary strategy or reproductive constraint? 51
Morse, D.H., s. Fritz, R.S. 194
Mortensen, D.A., s. Billings, W.D., et al. 26
Moungazi, A., s. Gautier-Hion, A., et al. 324
Muller, G.J., s. Andrews, T.J. 449
Nentwig, W.: Feeding ecology of the tropical spitting spider *Scytodes longipes* (Araneae, Scytodidae) 284
Neuvonen, S., s. Haukioja, E., et al. 363
Niemelä, P., s. Haukioja, E., et al. 214
Nilsen, E.T.: Seasonal and diurnal leaf movements of *Rhododendron maximum* L. in contrasting irradiance environments 296
Nur, N.: Feeding frequencies of nestling blue tits (*Parus caeruleus*): costs, benefits and a model of optimal feeding frequency 125
Ohmart, C.P.: Chemical interference among plants mediated by grazing insects. A reassessment (Short communication) 456
Ohmart, C.P., Stewart, L.G., Thomas, J.R.: Effects of food quality, particularly nitrogen concentrations, of *Eucalyptus blakelyi* foliage on the growth of *Paropsis atomaria* larvae (Coleoptera: Chrysomelidae) 543
Ortega, A., s. Barbault, R., et al. 550
Palo, R.T., Sunnerheim, K., Theander, O.: Seasonal variation of phenols, crude protein and cell wall content of birch (*Betula pendula* Roth.) in relation to ruminant in vitro digestibility 314
Parker, M.A., s. Salzman, A.G. 273
Parrish, J.A.D., Bazzaz, F.A.: Nutrient content of *Abutilon theophrasti* seeds and the competitive ability of the resulting plants 247
Patterson, D.T., s. Sionit, N. 30
Peterson, K.M., s. Billings, W.D., et al. 26
Platt, W.J., s. Kinsman, S. 2
Pough, F.H., Kamel, S.: Post-metamorphic change in activity metabolism of anurans in relation to life history 138
Quris, R., s. Gautier-Hion, A., et al. 324
Rausher, M.D., s. Miller Alexander, H., et al. 89
Rebelo, A.G., Siegfried, W.R.: Colour and size of flowers in relation to pollination of *Erica* species 584
Redford, K.H.: Mammalian predation on termites: tests with the burrowing mouse (*Oxymycterus roberti*) and its prey 145
Reichardt, P.B., Bryant, J.P., Clausen, T.P., Wieland, G.D.: Defense of winter-dormant Alaska paper birch against snowshoe hares 58
Ritland, D.B., Scriber, J.M.: Larval developmental rates of three putative subspecies of tiger swallowtail butterflies, *Papilio glaucus*, and their hybrids in relation to temperature 185
Robert, P.: A comparative study of some aspects of the reproduction of three *Caryedon serratus* strain in presence of its potential host plants 425
Roberts, T.M., s. Skeffington, R.A. 201
Robichaux, R.H.: Variation in the tissue water relations of two sympatric Hawaiian *Dubautia* species and their natural hybrid 75
Rothhaupt, K.O.: A model approach to the population dynamics of the rotifer *Brachionus rubens* in two-stage chemostat culture 252
Roussilhon, C., s. Gautier-Hion, A., et al. 324
Rundel, P.W., s. Meinzer, F.C., et al. 278
Ru-yung, Sun, Shao-liang, Jing.: Relation between average daily metabolic rate and resting metabolic rate of the mongolian gerbil (*Meriones unguiculatus*) 122
Salzman, A.G., Parker, M.A.: Neighbors ameliorate local salinity stress for a rhizomatous plant in a heterogeneous environment 273
Schaefer, D., Steinberger, Y., Whitford, W.G.: The failure of nitrogen and lignin control of decomposition in a north american desert 382
Scheibe, R., s. Schulze, E.-D., et al. 207
Schleser, G.H., Jayasekera, R.: $\delta^{13}C$-variations of leaves in forests as an indication of reassimilated CO_2 from the soil 536
Schulze, E.-D., Beck, E., Scheibe, R., Ziegler, P.: Carbon dioxide assimilation and stomatal response of afroalpine giant rosette plants 207
Schulze, E.-D., s. Gollan, T., et al. 356
Schulze, E.-D., s. Turner, N.C., et al. 348
Scriber, J.M., s. Ritland, D.B. 185
Semlitsch, R.D.: Reproductive strategy of a facultatively paedomorphic salamander *Ambystoma talpoideum* 305
Shao-liang, Jing., s. Ru-yung, Sun 122
Shorthouse, J.D., s. Lalonde, R.G. 161
Siegfried, W.R., s. Rebelo, A.G. 584
Sinclair, A.R.E., Dublin, H., Borner, M.: Population regulation of Serengeti Wildebeest: a test of the food hypothesis 266
Sionit, N., Patterson, D.T.: Responses of C_4 grasses to atmospheric CO_2 enrichment. I. Effect of irradiance 30
Sirén, S., s. Haukioja, E., et al. 214
Skeffington, R.A., Roberts, T.M.: The effects of ozone and acid mist on Scots pine saplings 201
Smiley, J.T.: Are chemical barriers necessary for evolution of butterfly-plant associations? 580
Sourd, C., s. Gautier-Hion, A., et al. 324
Steinberger, Y., s. Schaefer, D., et al. 382
Stemberger, R.S.: Prey selection by the copepod *Diacyclops thomasi* 492
Stenseth, N.Chr., s. Warkowska-Dratnal, H.. 468
Stewart, L.G., s. Ohmart, C.P., et al. 543
Strain, B.R., s. Tolley, L.C. 166
Sunnerheim, K., s. Palo, R.T., et al. 314
Suomela, J., s. Haukioja, E., et al. 363
Suthers, H.B.: Ground-feeding migratory sorgbirds as cellu-

lar slime mold distribution vectors 526
Swisher, S.G., s. Burton, R.S. 108
Tahvanainen, J., Helle, E., Julkunen-Tiitto, R., Lavola, A.: Phenolic compounds of willow bark as deterrents against feeding by mountain hare 319
Taylor, P.R., s. Hay, M.E. 591
Tenhunen, J.D., s. Weber, J.A., et al. 338
Theander, O., s. Palo, R.T., et al. 314
Thiollay, J.-M., s. Gautier-Hion, A., et al. 324
Thomas, J.R., s. Ohmart, C.P., et al. 543
Tinson, S., s. Laybourn-Parry, J. 566
Tolley, L.C., Strain, B.R.: Effects of CO_2 enrichment and water stress on gas exchange of *Liquidambar styraciflua* and *Pinus taeda* seedlings grown under different irradiance levels 166
Turner, N.C., Schulze, E.-D., Gollan, T.: The responses of stomata and leaf gas exchange to vapour pressure deficits and soil water content. II. In the mesophytic herbaceous species *Helianthus annuus* 348
Turner, N.C., s. Gollan, T., et al. 356
Vareschi, E., Jacobs, J.: The ecology of Lake Nakuru. VI. Synopsis of production and energy flow 412
Warkowska-Dratnal, H., Stenseth, N.Chr.: Dispersal and the microtine cycle: comparison of two hypotheses 468
Weber, J.A., Jurik, T.W., Tenhunen, J.D., Gates, D.M.: Analysis of gas exchange in seedlings of *Acer saccharum*: integration of field and laboratory studies 338
Weider, L.J., Lampert, W.: Differential response of *Daphnia* genotypes to oxygen stress: respiration rates, hemoglobin content and low-oxygen tolerance 487
Whitford, W.G., s. Schaefer, D., et al. 382
Wieland, G.D., s. Reichardt, P.B., et al. 58
Williams, J.: Statistical analysis of fluctuations in red grouse bag data 269
Willis, B.L., Ayre, D.J.: Asexual reproduction and genetic determination of growth form in the coral *Pavona cactus*: biochemical genetic and immunogenic evidence 516
Wissel, C.: A universal law of the characteristic return time near thresholds 101
Wolters, V.: Resource allocation in *Tomocerus flavescens* (Insecta, Collembola): a study with C-14-labelled food . . 229
Woombs, M., Laybourn-Parry, J.: Energy partitioning in three species of nematode from polysaprobic environments 289
Wright, D.H.: Patch dynamics of a foraging assemblage of bees 558
Yodzis, P.: Energy flow and the vertical structure of real ecosystems 86
Ziegler, P., s. Schulze, E.-D., et al. 207

Index in Current Contents